

CLAIMS

1. An image forming apparatus comprising:

5 a recording intermediate belt which does not have an end obtained by coupling two ends of a belt body of a band shape;

a platen drum and at least one roller around which the recording intermediate belt loops so as to be revolvable;

10 a dyeing layer formation section for forming a dyeing layer on an outer surface of the revolving recording intermediate belt;

15 a plurality of image formation sections which are located downstream of the dyeing layer formation section in the revolving direction of the recording intermediate belt, and which transfer dyes of different colors to the dyeing layer formed on the outer surface of the recording intermediate belt to form a color image; and

20 an image transfer section for transferring the dyeing layer on which an image of the image formation sections is formed to recording paper by thermocompression bonding, wherein

25 the dyeing layer formation section includes a dyeing layer transfer head for transferring the dyeing layer to the outer surface of the recording intermediate belt by thermocompression bonding,

the plurality of the image formation sections respectively include recording heads for transferring dyes of respective colors to the dyeing layer formed on the outer surface of the recording intermediate belt,

30 the dyeing layer transfer head and the recording heads are located in equal interval of length P, which is obtained by equally dividing length K of the entire circumference of the recording intermediate belt by n (n is integer),

the image formation section is formed, given that the position of a seam of the recording intermediate belt is origin O, to form an image in portions except for portions at origin O and at a distance of $1 \times P$, $2 \times P$, $\dots (n-1) \times P$ from origin O.

2. An image forming apparatus according to claim 1, wherein:
image formation areas formed by transferring dyes by the image formation sections to the dyeing layer formed on the recording intermediate belt by the dyeing layer formation section, and image non-formation areas formed by not transferring dyes by the image formation sections are repeatedly formed; and

the image non-formation areas between the image formation areas are formed such that length T along the revolving direction of the recording intermediate belt is larger than length R of the seam of the recording intermediate belt.

3. An image forming apparatus according to claim 1, comprising a separation roller for separating the recording intermediate belt and the recording paper which are thermocompression-bonded via the dyeing layer at the image transfer section,

wherein the separation roller is located at the position at a distance of $m \times P$ (m is integer) from the recording head of the image formation section in an upstream direction.

4. An image forming method for forming an image having a length longer than interval P between the dyeing layer transfer head and the recording heads by using the image forming apparatus according to claim 1, wherein;

an image is formed on a surface of the recording

intermediate belt during a plurality of cycles of revolving movement of the recording intermediate belt; and

5 only a predetermined head of the dyeing layer transfer head and the recording heads presses the recording intermediate belt in each cycle of the revolving movement of the recording intermediate belt.

10 5. An image forming method according to claim 4, wherein, for a plurality of cycles of the revolving movement of the recording intermediate belt, only the dyeing layer transfer head presses the recording intermediate belt in the first cycle of the revolving movement of the recording intermediate belt, and only the recording heads press the recording intermediate belt in the second cycle of the revolving movement of the recording intermediate belt.

15 6. An image forming apparatus comprising:

20 a recording intermediate belt which does not have an end obtained by coupling two ends of a belt body of a band shape;

a platen drum and at least one roller around which the recording intermediate belt loops so as to be revolvable;

25 a dyeing layer formation section for forming a dyeing layer on an outer surface of the revolving recording intermediate belt;

30 a plurality of image formation sections which are located downstream of the dyeing layer formation section in the revolving direction of the recording intermediate belt, and which transfer dyes of different colors to the dyeing layer formed on the outer surface of the recording intermediate belt to form a color image; and

an image transfer section for transferring the dyeing layer on which an image of the image formation sections is

formed to recording paper by thermocompression bonding, wherein

5 the dyeing layer formation section includes a dyeing layer transfer head for transferring the dyeing layer to the outer surface of the recording intermediate belt by thermocompression bonding,

10 the plurality of the image formation sections respectively include recording heads for transferring dyes of respective colors to the dyeing layer formed on the outer surface of the recording intermediate belt,

a mark is printed near a seam of the recording intermediate belt, and

detection means for detecting the mark is provided.

15 7. An image forming method using an image forming apparatus according to claim 6, wherein:

20 when the detection means detects the mark, the dyeing layer transfer head or the recording heads which includes the detection means stops pressing the recording intermediate belt.

8. An image forming apparatus comprising:

25 a recording intermediate belt which does not have an end obtained by coupling two ends of a belt body of a band shape;

30 a platen drum and at least one roller around which the recording intermediate belt loops so as to be revolvable; a dyeing layer formation section for forming a dyeing layer on an outer surface of the revolving recording intermediate belt;

a plurality of image formation sections which are located downstream of the dyeing layer formation section in the revolving direction of the recording intermediate

belt, and which transfer dyes of different colors to the dyeing layer formed on the outer surface of the recording intermediate belt to form a color image; and

5 an image transfer section for transferring the dyeing layer on which an image of the image formation sections is formed to recording paper by thermocompression bonding, wherein

10 the dyeing layer formation section includes a dyeing layer transfer head for transferring the dyeing layer to the outer surface of the recording intermediate belt by thermocompression bonding,

15 the plurality of the image formation sections respectively include recording heads for transferring dyes of respective colors to the dyeing layer formed on the outer surface of the recording intermediate belt,

the recording intermediate belt revolves all the time even when it does not form an image, and

20 a position of a seam of the recording intermediate belt is always detected, and image formation is started based on the detected results.

9. An image forming apparatus comprising:

25 a recording intermediate belt which does not have an end obtained by coupling two ends of a belt body of a band shape;

a platen drum and at least one roller around which the recording intermediate belt loops so as to be revolvable;

30 a dyeing layer formation section for forming a dyeing layer on an outer surface of the revolving recording intermediate belt;

a plurality of image formation sections which are located downstream of the dyeing layer formation section in the revolving direction of the recording intermediate

belt, and which transfer dyes of different colors to the dyeing layer formed on the outer surface of the recording intermediate belt to form a color image; and

5 an image transfer section for transferring the dyeing layer on which an image of the image formation sections is formed to recording paper by thermocompression bonding, wherein

10 the dyeing layer formation section includes a dyeing layer transfer head for transferring the dyeing layer to the outer surface of the recording intermediate belt by thermocompression bonding,

15 the plurality of the image formation sections respectively include recording heads for transferring dyes of respective colors to the dyeing layer formed on the outer surface of the recording intermediate belt, and

20 before an image formation operation is started, a seam of the recording intermediate belt, which does not have an end obtained by coupling two ends of a belt body of a band shape, is previously stopped at a position near the dyeing layer transfer head of the dyeing layer transfer section.

10. An image forming apparatus comprising:

25 a recording intermediate belt which does not have an end;

a platen drum and at least one roller around which the recording intermediate belt loops so as to be revolvable;

30 a dyeing layer formation section for forming a dyeing layer on an outer surface of the revolving recording intermediate belt;

a plurality of image formation sections which are located downstream of the dyeing layer formation section in the revolving direction of the recording intermediate

belt, and which transfer dyes of different colors to the dyeing layer formed on the outer surface of the recording intermediate belt to form a color image; and

5 an image transfer section for transferring the dyeing layer on which an image of the image formation sections is formed to recording paper by thermocompression bonding, wherein

10 the dyeing layer formation section includes a dyeing layer transfer head for transferring the dyeing layer to the outer surface of the recording intermediate belt by thermocompression bonding,

15 the plurality of the image formation sections respectively include recording heads for transferring dyes of respective colors to the dyeing layer formed on the outer surface of the recording intermediate belt, and

20 a positional deviation from designed values of the recording heads in the plurality of the image formation sections are previously measured, and based on the measured results, compensation of recording timings of the recording head is performed so as to absorb the positional deviation from the designed values.

11. An image forming apparatus comprising:

25 a recording intermediate belt which does not have an end;

a platen drum and at least one roller around which the recording intermediate belt loops so as to be revolvable;

30 a dyeing layer formation section for forming a dyeing layer on an outer surface of the revolving recording intermediate belt;

a plurality of image formation sections which are located downstream of the dyeing layer formation section in the revolving direction of the recording intermediate

belt, and which transfer dyes of different colors to the dyeing layer formed on the outer surface of the recording intermediate belt to form a color image; and

5 an image transfer section for transferring the dyeing layer on which an image of the image formation sections is formed to recording paper by thermocompression bonding, wherein

10 the dyeing layer formation section includes a dyeing layer transfer head for transferring the dyeing layer to the outer surface of the recording intermediate belt by thermocompression bonding,

15 the plurality of the image formation sections respectively include recording heads for transferring dyes of respective colors to the dyeing layer formed on the outer surface of the recording intermediate belt, and

20 relationships between pressing states of the recording heads of the recording intermediate belt and amounts of shift in recording positions due to small changes caused by being pressed by the recording heads are previously measured, and based on the measured results, compensation of recording timings of the recording heads is performed.

12. An image forming apparatus comprising:

25 a recording intermediate belt which does not have an end;

a platen drum and at least one roller around which the recording intermediate belt loops so as to be revolvable;

30 a dyeing layer formation section for forming a dyeing layer on an outer surface of the revolving recording intermediate belt;

a plurality of image formation sections which are located downstream of the dyeing layer formation section in the revolving direction of the recording intermediate

belt, and which transfer dyes of different colors to the dyeing layer formed on the outer surface of the recording intermediate belt to form a color image; and

5 an image transfer section for transferring the dyeing layer on which an image of the image formation sections is formed to recording paper by thermocompression bonding, wherein

10 the dyeing layer formation section includes a dyeing layer transfer head for transferring the dyeing layer to the outer surface of the recording intermediate belt by thermocompression bonding,

15 the plurality of the image formation sections respectively include recording heads for transferring dyes of respective colors to the dyeing layer formed on the outer surface of the recording intermediate belt, and

20 compensation of recording timings of the recording heads is performed in accordance with amounts of shift in recording positions of the recording heads of the image formation sections corresponding to a change in a rotation rate of the platen drum.

13. An image forming apparatus comprising:

a recording intermediate belt which does not have an end;

25 a platen drum and at least one roller around which the recording intermediate belt loops so as to be revolvable;

a dyeing layer formation section for forming a dyeing layer on an outer surface of the revolving recording intermediate belt by thermocompression bonding;

30 a plurality of image formation sections which are located downstream of the dyeing layer formation section in the revolving direction of the recording intermediate belt, and which transfer dyes of different colors to the

dyeing layer formed on the outer surface of the recording intermediate belt to form a color image;

5 an image transfer section for transferring the dyeing layer on which an image of the image formation sections is formed to recording paper by thermocompression bonding;

10 a separation roller which is provided downstream of the image transfer section in the revolving direction of the recording intermediate belt, and which guides the recording intermediate belt and the recording paper, which are pressure-bonded to each other via the dyeing layer and moving, in different directions to separate the recording intermediate belt and the recording paper from each other; and

15 cutting means for cutting the recording paper guided in a different direction from the recording intermediate belt by the separation roller into color images which have been formed,

20 wherein the cutting means is located such that the recording paper bends to an extent to absorb a cutting shock generated when the recording paper is cut by the cutting means.

14. An image forming apparatus comprising:

25 a recording intermediate belt which does not have an end;

a platen drum and at least one roller around which the recording intermediate belt loops so as to be revolvable;

30 a dyeing layer formation section for forming a dyeing layer on an outer surface of the revolving recording intermediate belt by thermocompression bonding;

a plurality of image formation sections which are located downstream of the dyeing layer formation section in the revolving direction of the recording intermediate

belt, and which transfer dyes of different colors to the dyeing layer formed on the outer surface of the recording intermediate belt to form a color image;

5 an image transfer section for transferring the dyeing layer on which an image of the image formation sections is formed to recording paper by thermocompression bonding; and

a control section for outputting control signals for respectively controlling the image formation sections based on an input image signal which has been input,

10 wherein the control section calculates a processing time of an input image signal which is input for each of images to be formed when images are formed continuously, and, based on the calculated results, sets an order for forming the images.

15

15. An image forming apparatus according to claim 14, wherein the control section sets an order for forming images such that images having processing times for input image signals which are input are longer than a pre-set reference value are not continuously formed.

20

16. An image forming apparatus according to claim 14, wherein the control section performs, based on calculated results of calculation on a processing time of an input image signal which is input, a process of input image signal of an image having a processing time for an input image signal longer than a pre-set reference value before forming an image.

25

17. An image forming apparatus comprising:
30 a recording intermediate belt which does not have an end;

a platen drum and at least one roller around which the recording intermediate belt loops so as to be revolvable;

a dyeing layer formation section for forming a dyeing layer on an outer surface of the revolving recording intermediate belt by thermocompression bonding;

5 a plurality of image formation sections which are located downstream of the dyeing layer formation section in the revolving direction of the recording intermediate belt, and which transfer dyes of different colors to the dyeing layer formed on the outer surface of the recording intermediate belt to form a color image;

10 an image transfer section for transferring the dyeing layer on which an image of the image formation sections is formed to recording paper by thermocompression bonding; and

15 a control section for outputting control signals for respectively controlling the image formation sections based on an input image signal which has been input,

20 wherein the control section is set to calculate a processing time of an input image signal which is input for each of images to be formed, and to perform a process of an input image signal of an image having a processing time for an input image signal longer than a pre-set reference value when an image formation operation is suspended for radiating heat from a high-temperature state caused by continuously performing image formation operations.